

FIG 1

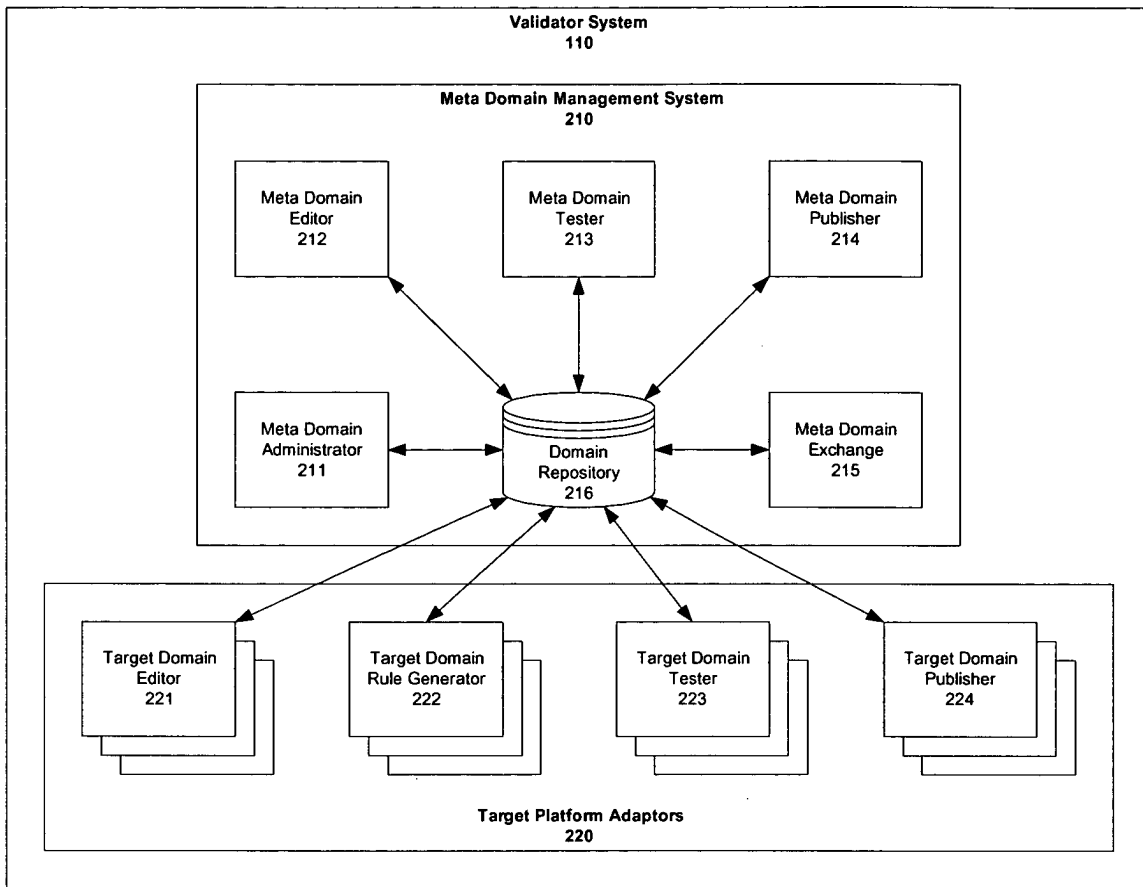


FIG 2

Meta Domains 310	
Domain Name	Description
Domain 1	
Domain 2	
.	
.	
Domain N	

Meta Domain Entities 320		
Domain	Entity Name	Description
Entity 1		
Entity 2		
.		
.		
Entity N		

Meta Domain Attributes 330			
Domain	Entity	Attribute Name	Description
Attribute 1			
Attribute 2			
.			
.			
Attribute N			

Meta Domain Relationships 340				
Domain	Entity 1	Entity 2	Relationship Type	Description
Relationship 1				
Relationship 2				
.				
.				
Relationship N				

FIG 3

Metarules 410						
Metarule Name	Required	Data Type	Min Length	Max Length	Valid Values	Error Message
Metarule 1						
Metarule 2						
.						
.						
.						
Metarule N						

Association of Meta Domain Attributes to Metarules 420			
Domain	Entity	Attribute	Metarule
Association 1			
Association 2			
.			
.			
.			
Association N			

FIG 4

Meta Domain Test Suites 510	
Meta Domain	Test Suite
Test Suite 1	
Test Suite 2	
.	
.	
.	
Test Suite N	

Meta Domain Tests 520	
Test Suite	Test
Test 1	
Test 2	
.	
.	
.	
Test N	

Meta Domain Test Values 530					
Test Suite	Test	Entity	Instance	Attribute	Value
Value 1					
Value 2					
.					
.					
.					
Value N					

Meta Domain Expected Violations 540					
Test Suite	Test	Entity	Instance	Attribute	Metarule
Violation 1					
Violation 2					
.					
.					
.					
Violation N					

FIG 5

Entity Documentation

Description of Entity

Attribute 1 Documentation

Description of Attribute 1

Validations for Attribute 1

Validation 1

Validation 2

Validation N

Attribute 2 Documentation

Description of Attribute 2

Validations for Attribute 2

Validation 1

Validation 2

Validation N

.

.

.

Attribute N Documentation

Description of Attribute N

Validations for Attribute N

Validation 1

Validation 2

Validation N

FIG 6

Java Domains 710	
Domain Name	Description
Domain 1	
Domain 2	
.	
.	
Domain N	

Java Domain Classes 720		
Domain	Class Name	Description
Class 1		
Class 2		
.		
.		
.		
Class N		

Java Domain Instance Variables 730						
	Domain	Class	Instance Variable	Data Type	Accessor	Description
Instance Variable 1						
Instance Variable 2						
.						
.						
.						
Instance Variable N						

Java Domain Object References 740					
	Domain	Class	Instance Variable	Cardinality	Validate
Reference 1					
Reference 2					
.					
.					
.					
Reference N					

FIG 7

Mapping of Meta Domain to Java Domain 810					
Meta Domain	Meta Domain Entity	Meta Domain Attribute	Java Target Domain	Java Target Domain Class	Java Target Domain Instance Variable
Mapping 1					
Mapping 2					
.					
.					
.					
Mapping N					

FIG 8

Java Domain Test Suites 910	
Java Domain	Test Suite
Test Suite 1	
Test Suite 2	
.	
.	
.	
Test Suite N	

Java Domain Tests 920	
Test Suite	Test
Test 1	
Test 2	
.	
.	
.	
Test N	

Java Domain Test Values 930					
Test Suite	Test	Class	Instance	Instance Variable	Value
Value 1					
Value 2					
.					
.					
.					
Value N					

Java Domain Expected Violations 940					
Test Suite	Test	Class	Instance	Instance Variable	Metarule
Violation 1					
Violation 2					
.					
.					
.					
Violation N					

FIG 9

Class Documentation

Description of Class

Instance Variable 1 Documentation

Description of Instance Variable 1

Validations for Instance Variable 1

Validation 1

Validation 2

.

Validation N

Instance Variable 2 Documentation

Description of Instance Variable 2

Validations for Instance Variable 2

Validation 1

Validation 2

.

Validation N

.

.

.

Instance Variable N Documentation

Description of Instance Variable N

Validations for Instance Variable N

Validation 1

Validation 2

.

Validation N

FIG 10

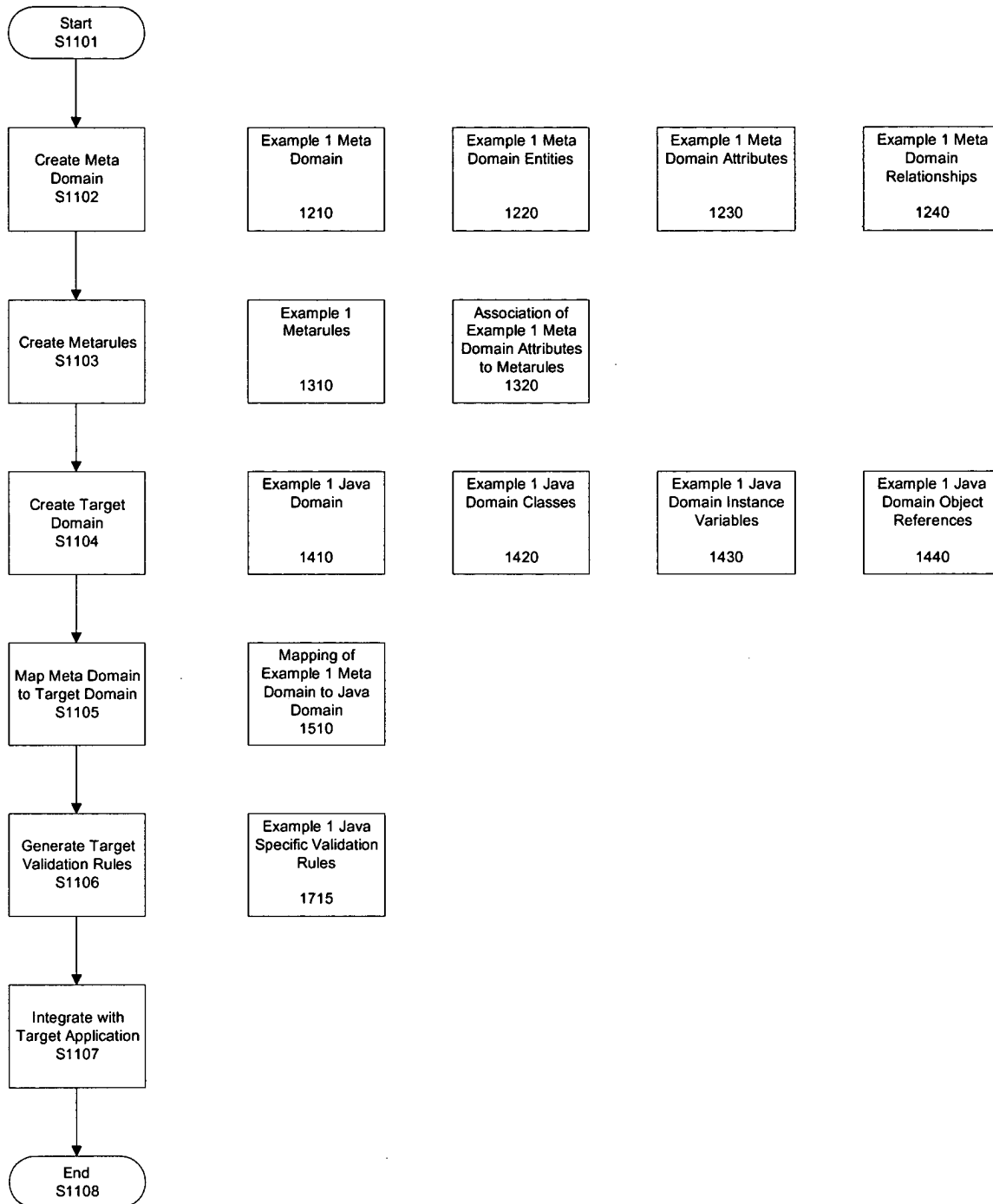


FIG 11

Example 1 Meta Domain 1210	
Domain Name	Description
Example 1 Meta Domain	Meta Domain for Example 1.

Example 1 Meta Domain Entities 1220		
Domain	Entity Name	Description
Example 1 Meta Domain	Customer	The customer name and contact information.

Example 1 Meta Domain Attributes 1230			
Domain	Entity	Attribute Name	Description
Example 1 Meta Domain	Customer	Last Name	The last name of the customer.
Example 1 Meta Domain	Customer	First Name	The first name of the customer.
Example 1 Meta Domain	Customer	Middle Initial	The middle initial of the customer.
Example 1 Meta Domain	Customer	Home Phone	The home phone number of the customer.
Example 1 Meta Domain	Customer	Work Phone	The work phone number of the customer.
Example 1 Meta Domain	Customer	Street Address	The street address of the customer.
Example 1 Meta Domain	Customer	City	The city in which the customer resides.
Example 1 Meta Domain	Customer	State	The state in which the customer resides.
Example 1 Meta Domain	Customer	Zip Code	The zip code in which the customer resides.

Example 1 Meta Domain Relationships 1240				
Domain	Entity 1	Entity 2	Relationship Type	Description

FIG 12

Example 1 Metarules 1310						
Metarule Name	Req	Data Type	Min Length	Max Length	Valid Values	Error Message
Last Name Rule	Yes	Alpha	1	15		is required and cannot be greater than 15 characters in length
First Name Rule	Yes	Alpha	1	25		is required and cannot be greater than 25 characters in length
Phone Rule	No	Numeric	10	10		must be composed of 10 digits
Required Rule	Yes					is required
Street Address Rule	Yes	Text	1	35		is required and cannot be greater than 35 characters in length
City Rule	Yes	Text	1	15		is required and cannot be greater than 15 characters in length
State Rule	Yes	Alpha	2	2	AK, AL, AR, AZ, CA, CO, CT, DE, FL, GA, HI, LA, IA, ID, IL, IN, KS, KY, MA, MD, ME, MI, MN, MO, MS, MT, NC, ND, NE, NH, NM, NJ, NV, NY, OH, OK, OR, PA, RI, SC, SD, TN, TX, UT, VA, VT, WA, WI, WV, WY	must be a valid two character state code
Zip Code Rule	Yes	Numeric	5	5		is required and must be composed of 5 digits

Association of Example 1 Meta Domain Attributes to Metarules 1320			
Domain	Entity	Attribute	Metarule
Example 1 Meta Domain	Customer	Last Name	Last Name Rule
Example 1 Meta Domain	Customer	First Name	First Name Rule
Example 1 Meta Domain	Customer	Home Phone	Phone Rule
Example 1 Meta Domain	Customer	Home Phone	Required Rule
Example 1 Meta Domain	Customer	Work Phone	Phone Rule
Example 1 Meta Domain	Customer	Street Address	Street Address Rule
Example 1 Meta Domain	Customer	City	City Rule
Example 1 Meta Domain	Customer	State	State Rule
Example 1 Meta Domain	Customer	Zip Code	Zip Code Rule

FIG 13

Example 1 Java Domain 1410	
Domain Name	Description
Example 1 Java Domain	The Java target domain for Example 1.

Example 1 Java Domain Classes 1420		
Domain	Class Name	Description
Example 1 Java Domain	Person	Person object contains a person's name, address, and telephone numbers.
Example 1 Java Domain	Address	Address object contains an address of a Person.

Example 1 Java Domain Instance Variables 1430					
Domain	Class	Instance Variable Name	Data Type	Accessor	Description
Example 1 Java Domain	Person	lastName	String	getLastName	The last name of the person.
Example 1 Java Domain	Person	firstName	String	getFirstName	The first name of the person.
Example 1 Java Domain	Person	middleInitial	String	getMiddleInitial	The middle initial of the person.
Example 1 Java Domain	Person	homePhone	String	getHomePhone	The home phone number of the person.
Example 1 Java Domain	Person	workPhone	String	getWorkPhone	The work phone number of the person.
Example 1 Java Domain	Person	homeAddress	Address	getHomeAddress	The home address of the person.
Example 1 Java Domain	Address	street	String	getStreet	The street address.
Example 1 Java Domain	Address	city	String	getCity	The city.
Example 1 Java Domain	Address	state	String	getState	The state code.
Example 1 Java Domain	Address	zip	String	getZip	The 5 digit zip code.

Example 1 Java Domain Object References 1440				
Domain	Class	Instance Variable	Cardinality	Validate
Example 1 Java Domain	Person	homeAddress	One	Yes

FIG 14

Mapping of Example 1 Meta Domain to Java Domain 1510					
Meta Domain	Meta Domain Entity	Meta Domain Attribute	Target Domain	Target Domain Class	Target Domain Instance Variable
Example 1 Meta Domain	Customer	Last Name	Example 1 Java Domain	Person	lastName
Example 1 Meta Domain	Customer	First Name	Example 1 Java Domain	Person	firstName
Example 1 Meta Domain	Customer	Middle Initial	Example 1 Java Domain	Person	middleInitial
Example 1 Meta Domain	Customer	Home Phone	Example 1 Java Domain	Person	homePhone
Example 1 Meta Domain	Customer	Work Phone	Example 1 Java Domain	Person	workPhone
Example 1 Meta Domain	Customer	Street Address	Example 1 Java Domain	Address	street
Example 1 Meta Domain	Customer	City	Example 1 Java Domain	Address	city
Example 1 Meta Domain	Customer	State	Example 1 Java Domain	Address	state
Example 1 Meta Domain	Customer	Zip Code	Example 1 Java Domain	Address	zip

FIG 15

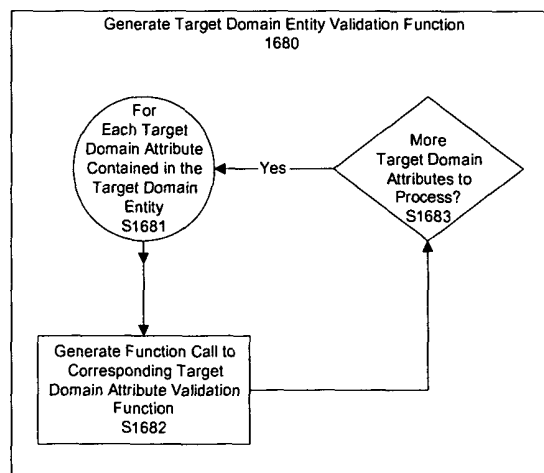
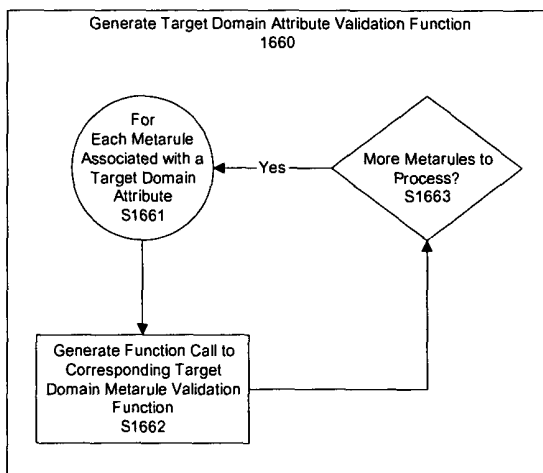
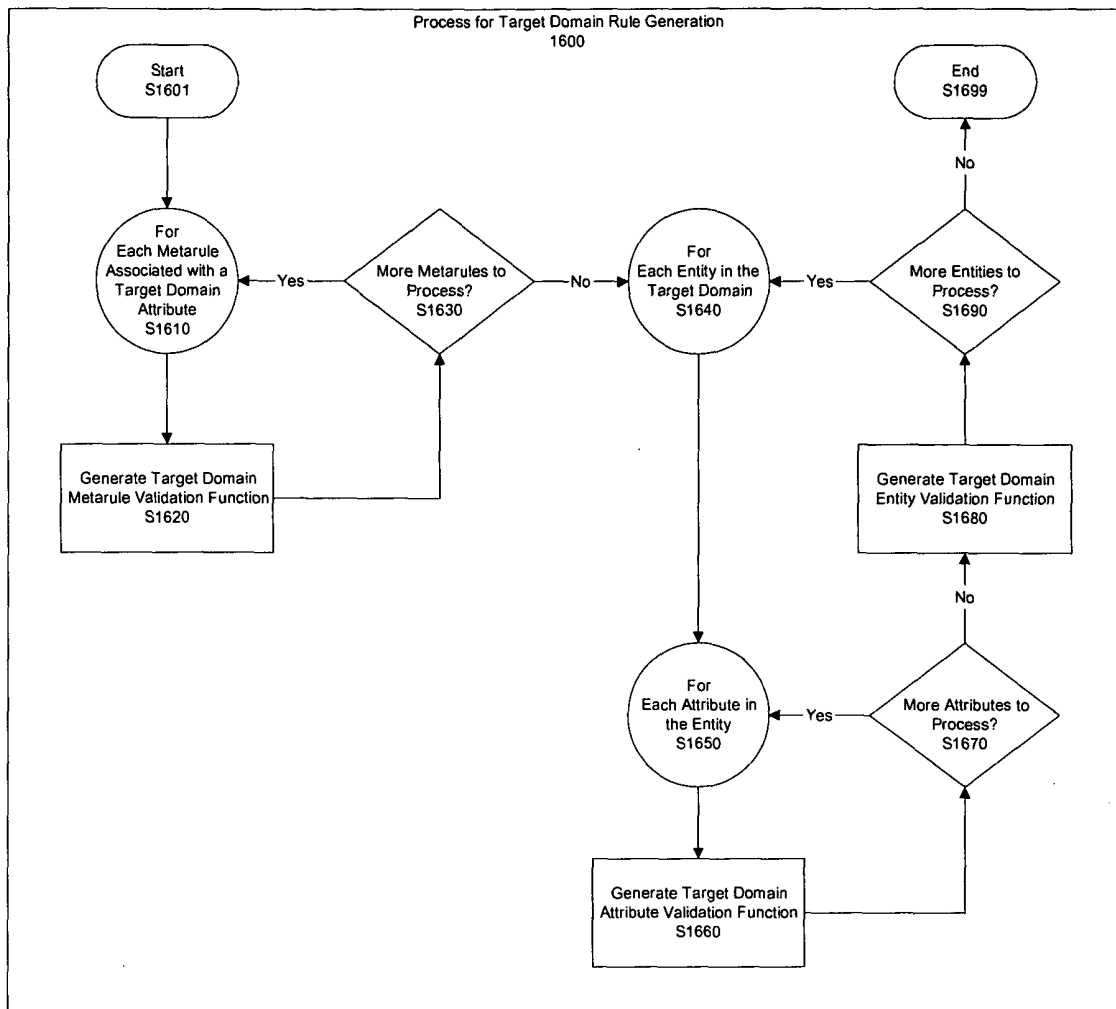


FIG 16

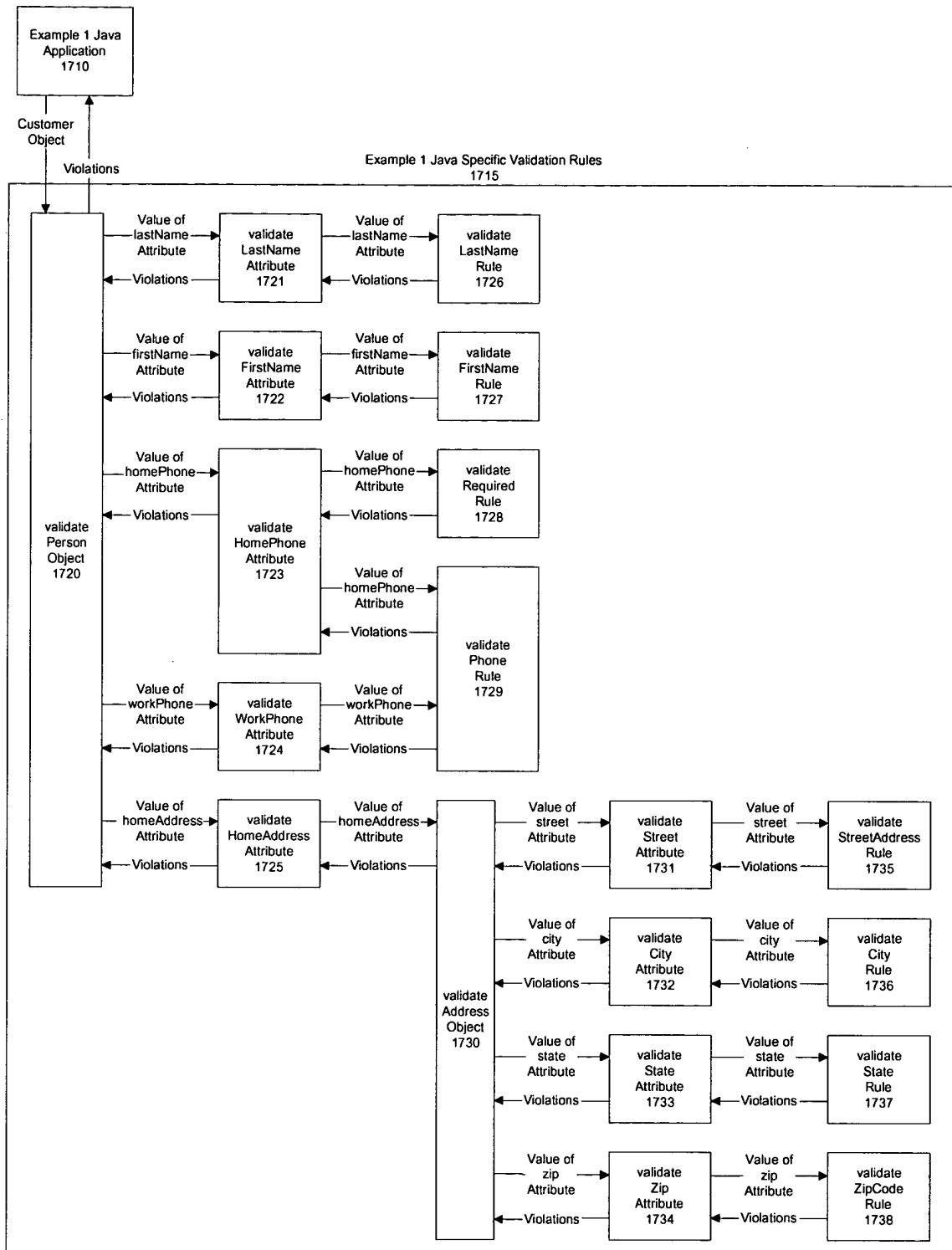


FIG 17

Example 1 Meta Domain Test Suites 1810	
Meta Domain	Test Suite
Example 1 Meta Domain	Example 1 Test Suite

Example 1 Meta Domain Tests 1820	
Test Suite	Test
Example 1 Test Suite	Test 1
Example 1 Test Suite	Test 2

Example 1 Meta Domain Test Values 1830					
Test Suite	Test	Entity	Instance	Attribute	Value
Example 1 Test Suite	Test 1	Customer	Customer 1	Last Name	Doe
Example 1 Test Suite	Test 1	Customer	Customer 1	First Name	John
Example 1 Test Suite	Test 1	Customer	Customer 1	Middle Initial	T
Example 1 Test Suite	Test 1	Customer	Customer 1	Home Phone	8005551212
Example 1 Test Suite	Test 1	Customer	Customer 1	Work Phone	8005552222
Example 1 Test Suite	Test 1	Customer	Customer 1	Street Address	123 Main Street
Example 1 Test Suite	Test 1	Customer	Customer 1	City	Peoria
Example 1 Test Suite	Test 1	Customer	Customer 1	State	IL
Example 1 Test Suite	Test 1	Customer	Customer 1	Zip Code	99999
Example 1 Test Suite	Test 2	Customer	Customer 1	Last Name	Doe
Example 1 Test Suite	Test 2	Customer	Customer 1	First Name	John
Example 1 Test Suite	Test 2	Customer	Customer 1	Middle Initial	T
Example 1 Test Suite	Test 2	Customer	Customer 1	Home Phone	8005551212
Example 1 Test Suite	Test 2	Customer	Customer 1	Work Phone	8005552222
Example 1 Test Suite	Test 2	Customer	Customer 1	Street Address	123 Main Street
Example 1 Test Suite	Test 2	Customer	Customer 1	City	Peoria
Example 1 Test Suite	Test 2	Customer	Customer 1	State	IH
Example 1 Test Suite	Test 2	Customer	Customer 1	Zip Code	

Example 1 Meta Domain Expected Violations 1840					
Test Suite	Test	Entity	Instance	Attribute	Metarule
Example 1 Test Suite	Test 2	Customer	Customer1	Work Phone	Phone Rule
Example 1 Test Suite	Test 2	Customer	Customer1	State	State Rule
Example 1 Test Suite	Test 2	Customer	Customer1	Zip Code	Zip Code Rule

FIG 18

Example 1 Java Domain Test Suites 1910	
Domain	Test Suite
Example 1 Java Domain	Example 1 Test Suite

Example 1 Java Domain Tests 1920	
Test Suite	Test
Example 1 Test Suite	Test 1
Example 1 Test Suite	Test 2

Example 1 Java Domain Test Values 1930					
Test Suite	Test	Class	Instance	Instance Variable	Value
Example 1 Test Suite	Test 1	Person	Customer 1	lastName	Doe
Example 1 Test Suite	Test 1	Person	Customer 1	firstName	John
Example 1 Test Suite	Test 1	Person	Customer 1	middleInitial	T
Example 1 Test Suite	Test 1	Person	Customer 1	homePhone	8005551212
Example 1 Test Suite	Test 1	Person	Customer 1	workPhone	8005552222
Example 1 Test Suite	Test 1	Person	Customer 1	homeAddress	Home Address 1
Example 1 Test Suite	Test 1	Address	Home Address 1	street	123 Main Street
Example 1 Test Suite	Test 1	Address	Home Address 1	city	Peoria
Example 1 Test Suite	Test 1	Address	Home Address 1	state	IL
Example 1 Test Suite	Test 1	Address	Home Address 1	zip	99999
Example 1 Test Suite	Test 2	Person	Customer 1	lastName	Doe
Example 1 Test Suite	Test 2	Person	Customer 1	firstName	John
Example 1 Test Suite	Test 2	Person	Customer 1	middleInitial	T
Example 1 Test Suite	Test 2	Person	Customer 1	homePhone	8005551212
Example 1 Test Suite	Test 2	Person	Customer 1	workPhone	8005552222
Example 1 Test Suite	Test 2	Person	Customer 1	homeAddress	Home Address 1
Example 1 Test Suite	Test 2	Address	Home Address 1	street	123 Main Street
Example 1 Test Suite	Test 2	Address	Home Address 1	city	Peoria
Example 1 Test Suite	Test 2	Address	Home Address 1	state	IH
Example 1 Test Suite	Test 2	Address	Home Address 1	zip	

Example 1 Java Domain Expected Violations 1940					
Test Suite	Test	Class	Instance	Instance Variable	Metarule
Example 1 Test Suite	Test 2	Person	Customer 1	workPhone	Phone Rule
Example 1 Test Suite	Test 2	Address	Home Address 1	state	State Rule
Example 1 Test Suite	Test 2	Address	Home Address 1	zip	Zip Code Rule

FIG 19

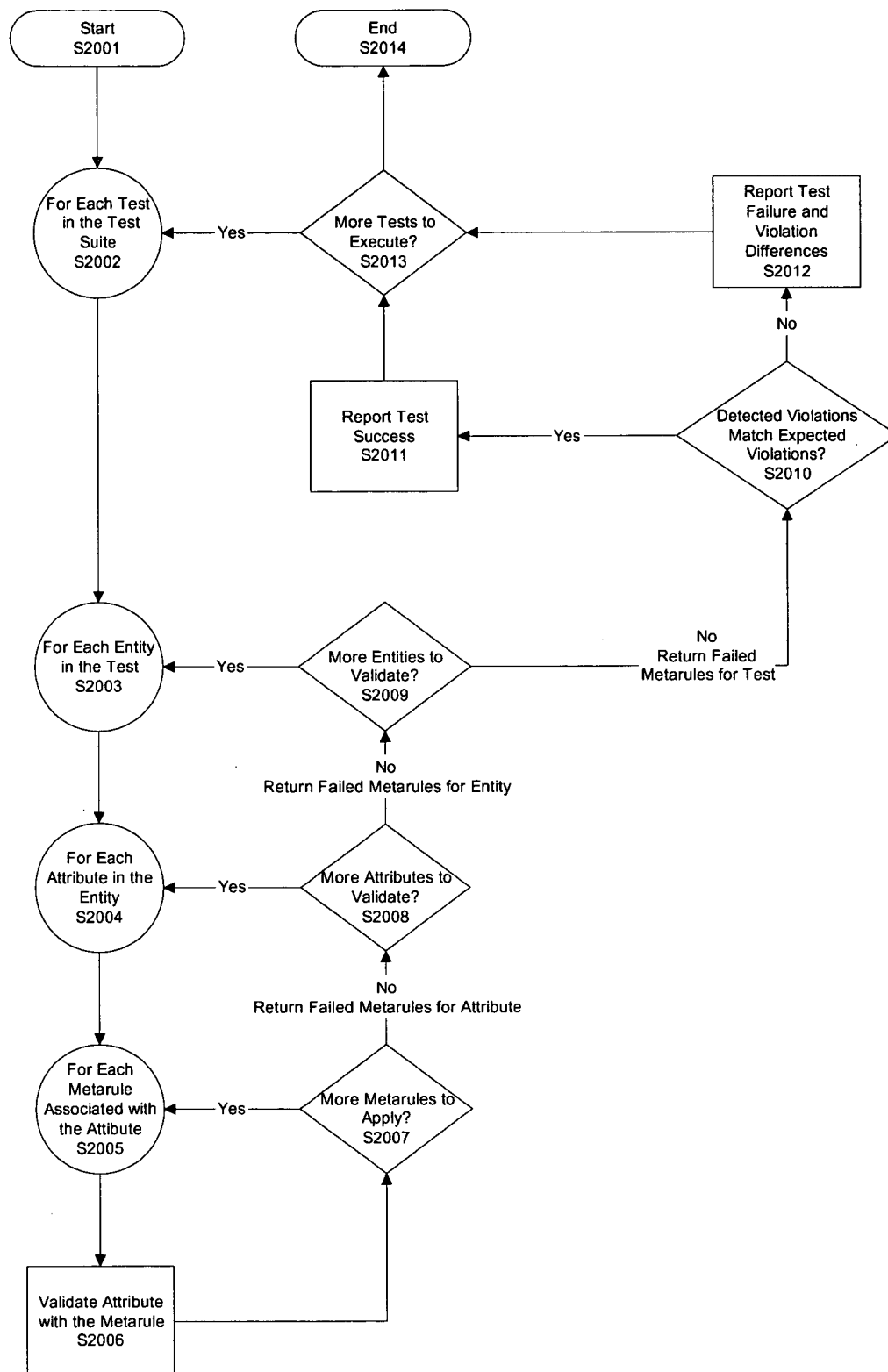


FIG 20

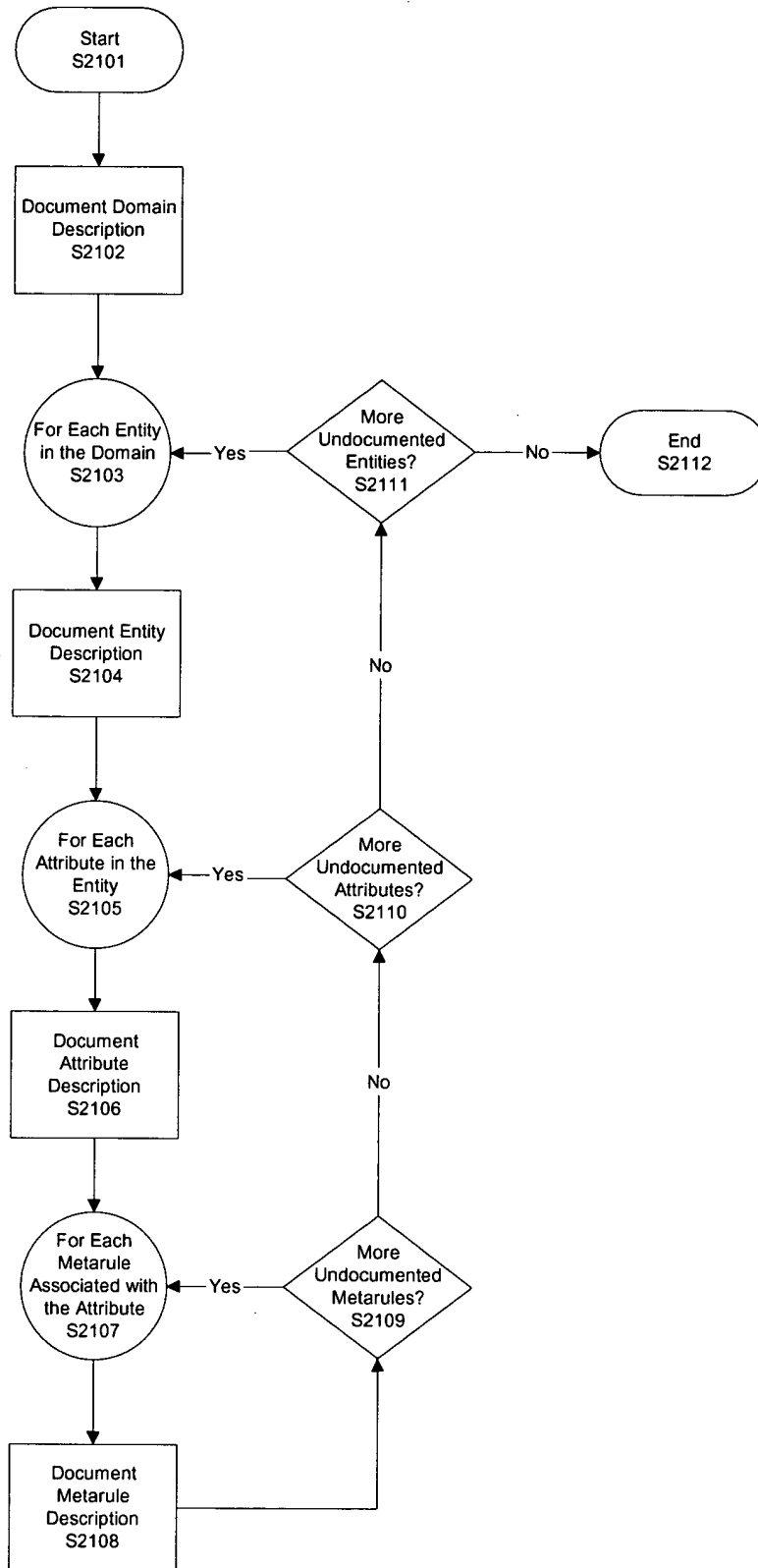


FIG 21

Example 1 Meta Domain

Description: Meta Domain for Example 1.

Entity: Customer

Description: The customer name and contact information.

Attribute: Last Name

Description: The last name of the customer.

Validations:

- Is required.
- Cannot be greater than 25 characters in length.

Attribute: First Name

Description: The first name of the customer.

Validations:

- Is required.
- Cannot be greater than 15 characters in length.

Attribute: Middle Initial

Description: The middle initial of the customer.

Validations: None

Attribute: Home Phone

Description: The home phone number of the customer.

Validations:

- Is required.
- Must be numeric.
- Must be 10 characters in length.

Attribute: Work Phone

Description: The work phone number of the customer.

Validations:

- Must be numeric.
- Must be 10 characters in length.

Attribute: Street Address

Description: The street address of the customer.

Validations:

- Is required.
- Cannot be greater than 35 characters in length.

Attribute: City

Description: The city in which the customer resides.

Validations:

- Is required.
- Cannot be greater than 15 characters in length.

Attribute: State

Description: The state in which the customer resides.

Validations:

- Is required.
- Must be one of the following valid values:
AK, AL, AR, AZ, CA, CO, CT, DE, FL, GA, HI, LA, IA, ID, IL, IN, KS, KY, MA, MD,
ME, MI, MN, MO, MS, MT, NC, ND, NE, NH, NM, NJ, NV, NY, OH, OK, OR, PA, RI,
SC, SD, TN, TX, UT, VA, VT, WA, WI, WV, WY

Attribute: Zip Code

Description: The zip code in which the customer resides.

Validations:

- Is required.
- Must be numeric.
- Must be 5 characters in length

FIG 22

Java Target Domain for Example 1

Description: The Java target domain for Example 1.

Class: Person

Description: Person object contains a person's name, address, and telephone numbers.

Instance Variable: lastName

Description: The last name of the person.

Validations:

- Is required.
- Cannot be greater than 25 characters in length.

Instance Variable: firstName

Description: The first name of the person.

Validations:

- Is required.
- Cannot be greater than 15 characters in length.

Instance Variable: middleInitial

Description: The middle initial of the person.

Validations: None

Instance Variable: homePhone

Description: The home phone number of the person.

Validations:

- Is required.
- Must be numeric.
- Must be 10 characters in length.

Instance Variable: workPhone

Description: The work phone number of the person.

Validations:

- Must be numeric.
- Must be 10 characters in length.

Instance Variable: homeAddress

Description: The home address of the person.

Validations: See the Address class.

Class: Address

Description: Address object contains an address of a Person.

Instance Variable: street

Description: The street address.

Validations:

- Is required.
- Cannot be greater than 35 characters in length.

Instance Variable: city

Description: The city.

Validations:

- Is required.
- Cannot be greater than 15 characters in length.

Instance Variable: state

Description: The state code.

Validations:

- Is required.
- Must be one of the following valid values:
AK, AL, AR, AZ, CA, CO, CT, DE, FL, GA, HI, LA, IA, ID, IL, IN, KS, KY, MA, MD,
ME, MI, MN, MO, MS, MT, NC, ND, NE, NH, NM, NJ, NV, NY, OH, OK, OR, PA, RI, SC,
SD, TN, TX, UT, VA, VT, WA, WI, WV, WY

Instance Variable: zip

Description: The 5 digit zip code.

Validations:

- Is required.
- Must be numeric.
- Must be 5 characters in length

FIG 23

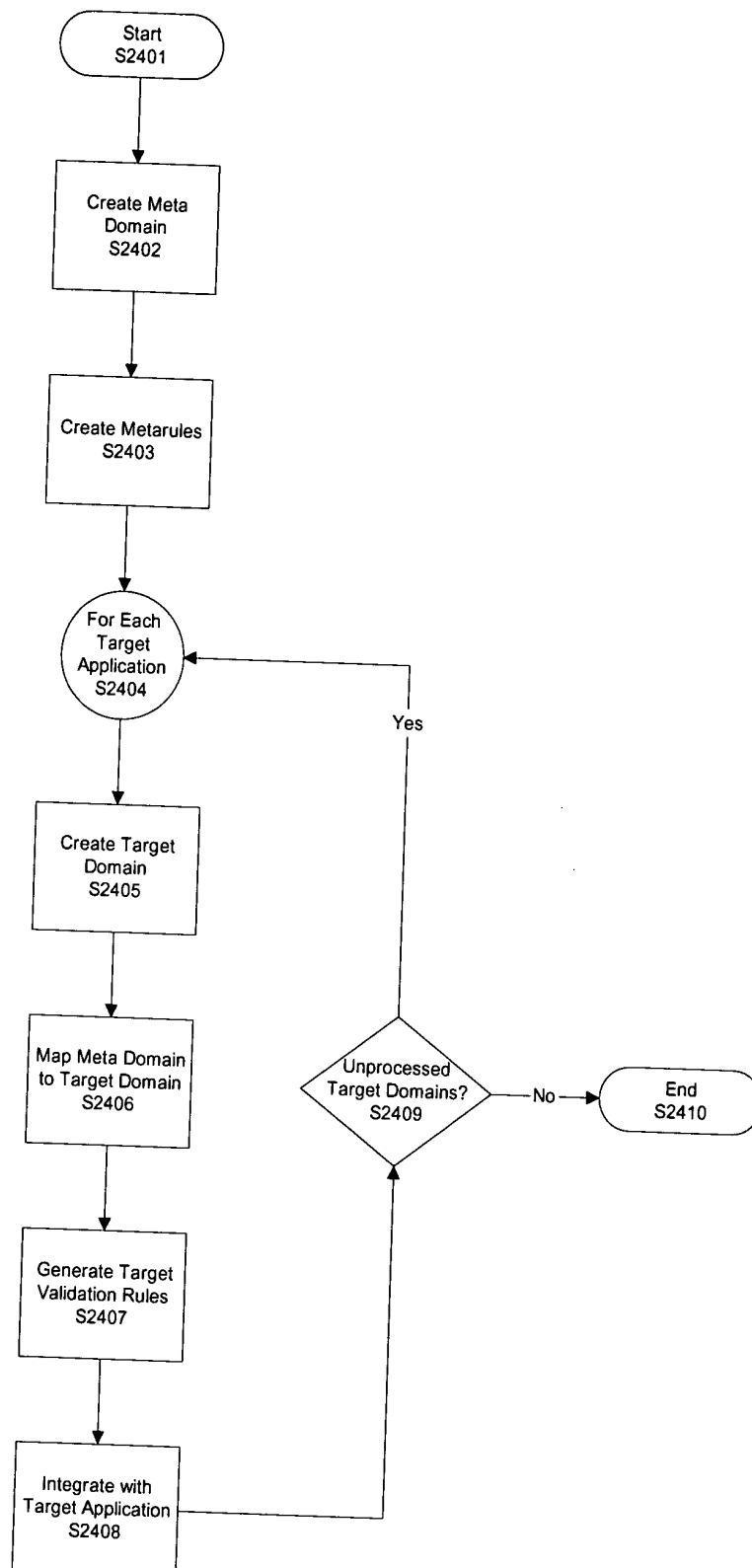


FIG 24

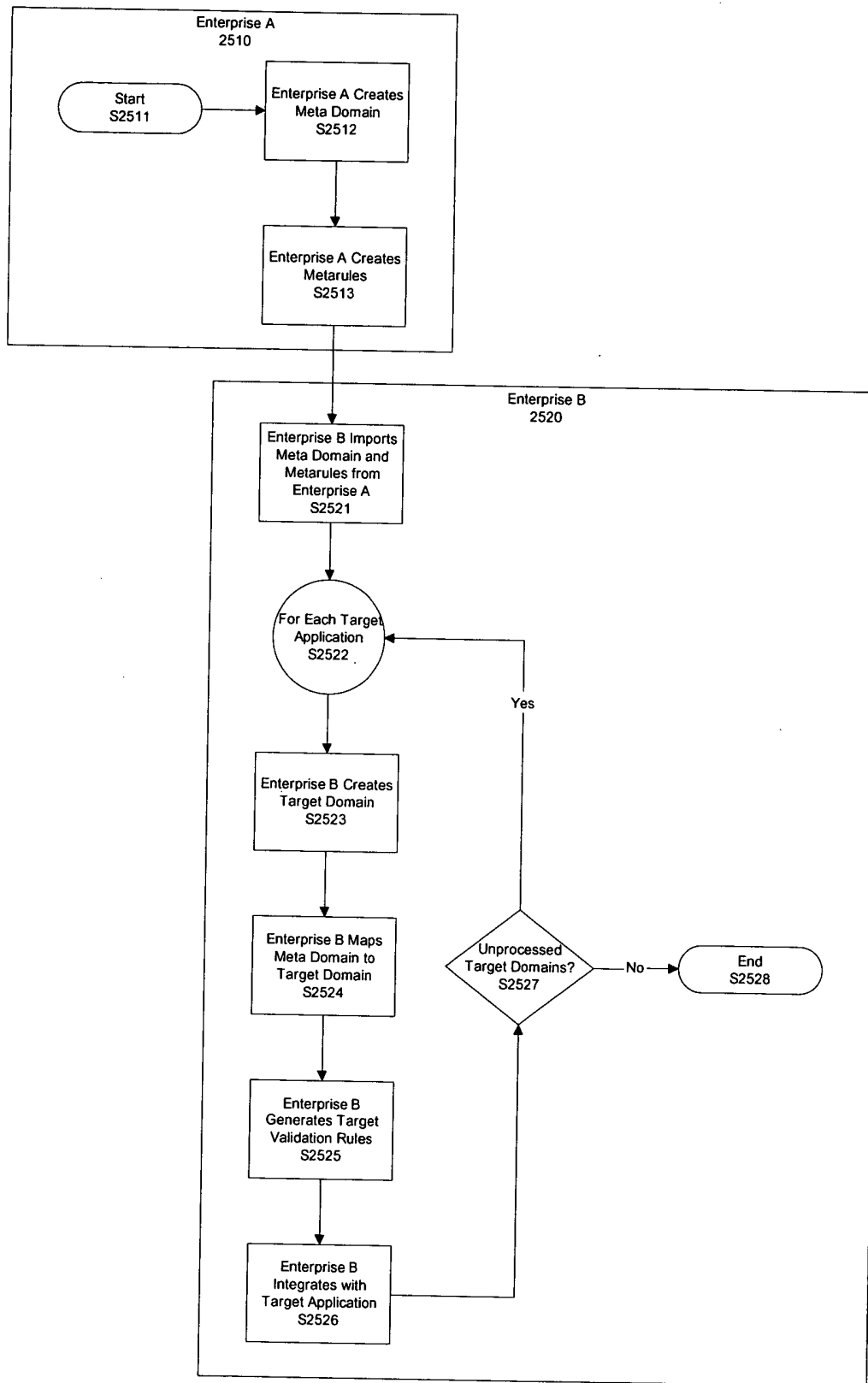


FIG 25